

NAME:

DATE:

## Unit-2 Mastery Assessment (version 615)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[14] = 3$ , then there exists a knowable solution to the equation below.

$$y = 6 \cdot f\left[\frac{x}{9} + 10\right] + 22$$

Find the solution.

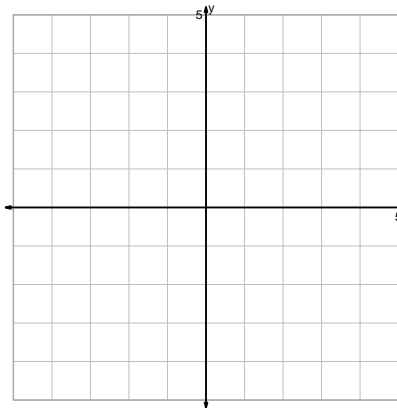
$x =$

$y =$

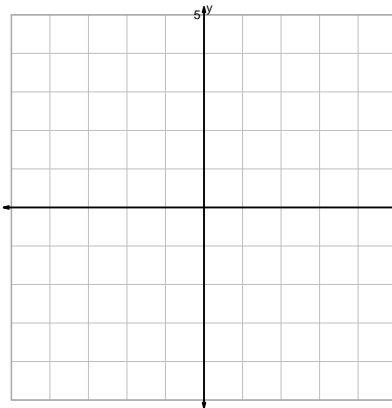
### Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

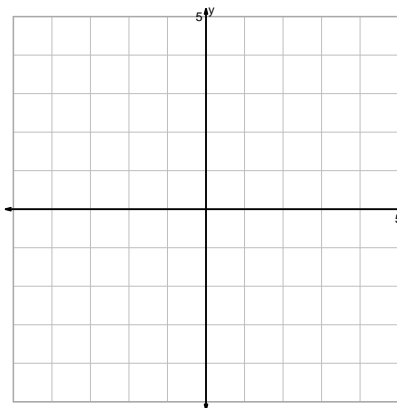
$$y = (x+2)^2$$



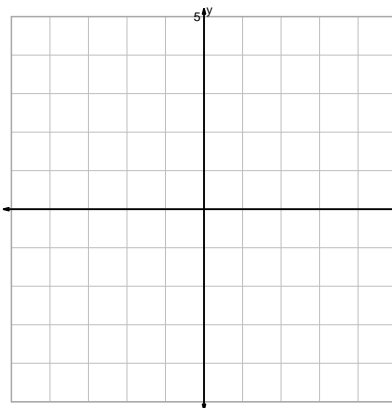
$$y = \sqrt{x-2}$$



$$y = 2^{\frac{x}{2}}$$

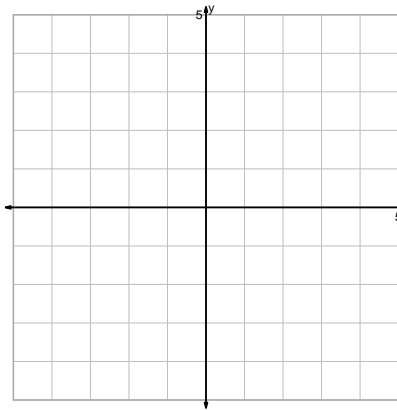


$$y = -\log_2(x)$$

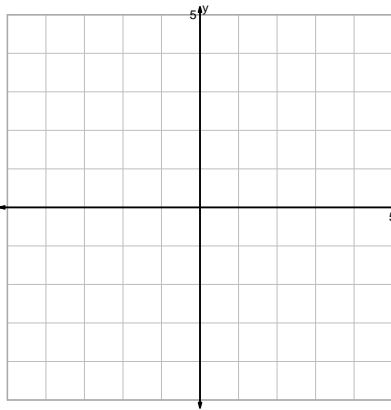


Question 2 continued...

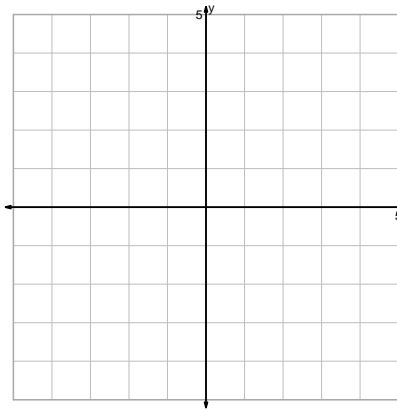
$$y = \frac{x^3}{2}$$



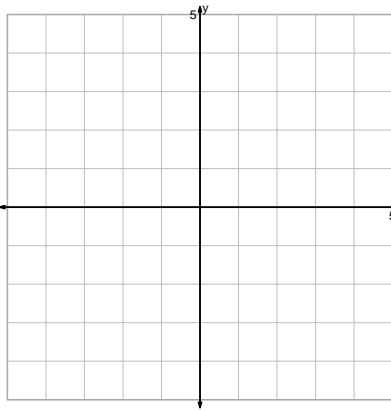
$$y = \log_2(2x)$$



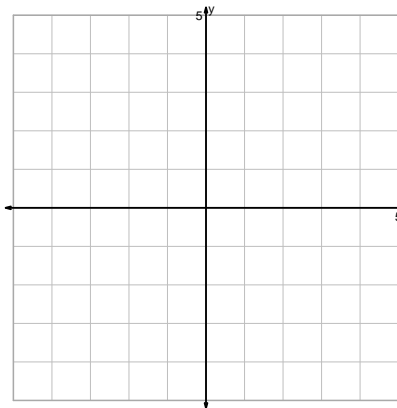
$$y = \sqrt[3]{x} + 2$$



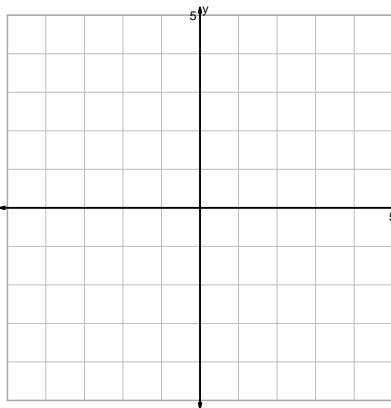
$$y = x^2 - 2$$



$$y = 2 \cdot x^3$$

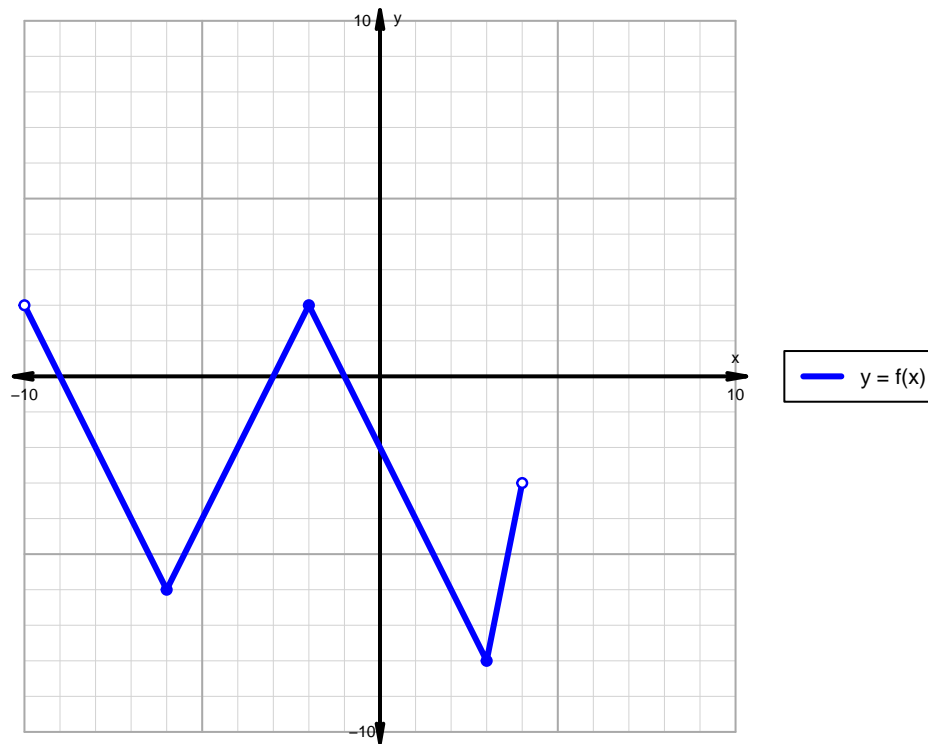


$$y = \sqrt{-x}$$



### Question 3 (20 points)

A function is graphed below.



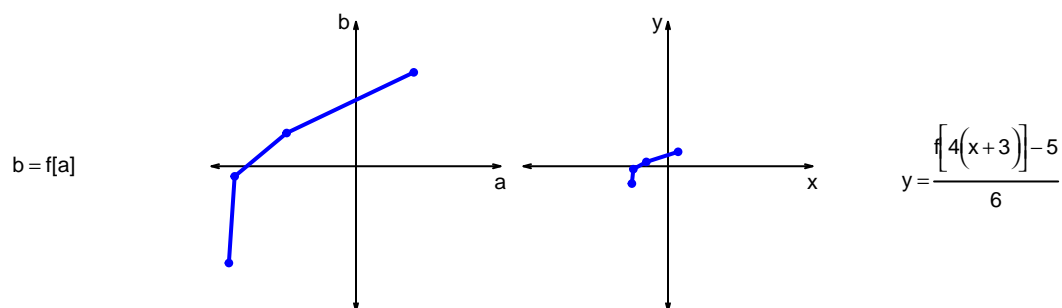
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

**Question 4 (20 points)**

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f[4(x+3)]-5}{6}$  are represented below in a table and on graphs.

a	b	x	y
-88	-67	-25	-12
-84	-7	-24	-2
-48	23	-15	3
40	65	7	10



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

- b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f[4(x+3)]-5}{6}$ ?

**Question 5 (10 points)**

A parent square-root function is transformed in the following ways:

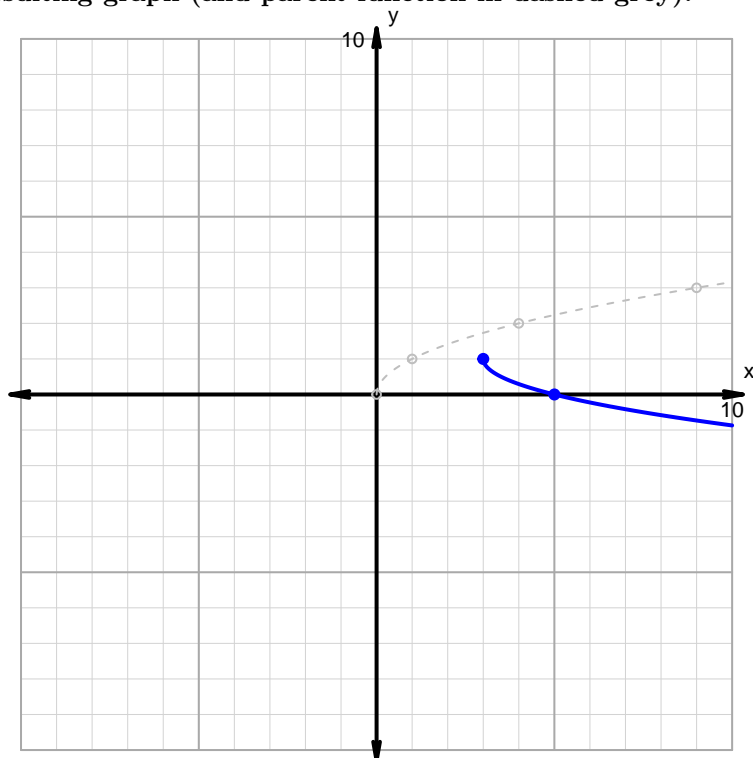
**Horizontal transformations**

1. Horizontal stretch by factor 2.
2. Translate right by distance 3.

**Vertical transformations**

1. Vertical reflection over  $x$  axis.
2. Translate up by distance 1.

**Resulting graph (and parent function in dashed grey):**



- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = 2 \cdot |x - 1| - 6$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	